Renormalization of interacting diffusions: a program and four examples

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Abstract: Systems of hierarchically interacting diffusions allow for a rigorous *renormalization analysis*. By bringing into play the powerful machinery of stochastic analysis, it is possible to obtain a complete classification of the large space-time behavior of these systems into *universality classes*. The present paper outlines a general renormalization program that is being pursued since ten years and describes four examples where this program has been successfully carried through. The systems under consideration model the evolution of multi-type populations subject to migration and resampling. continuous maps.

Keywords: Interacting diffusions, hierarchical group, multi-type populations, multi-scale block averages, renormalization transformation, fixed points and fixed shapes, attracting orbits, universality classes.
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